

REMARKS

By the present amendment and response, independent claim 24 and dependent claim 28 have been amended to overcome the Examiner's objections and claim 27 has been canceled. Thus, claims 24-26 and 28-48 remain pending in the present application. Reconsideration and allowance of pending claims 24-26 and 28-48 in view of the following remarks are requested.

The Examiner has requested that the drawings be corrected so that reference characters "202" and "302" do not designate both first permeability dielectric and second permeability dielectric. According to the Examiner's observations and as regards reference character 302, Applicant has amended Figure 3A and Figure 3B as also noted on the amended drawings and further in the amended specification submitted herewith. However, with respect to reference character 202, it is noted that Figures 2A and 2B, including reference character "202," refer to an embodiment of the present invention defined by independent claim 31. Independent claim 31 embodies a single dielectric, and, as such, Applicant submits that the use of reference character "202" throughout Figures 2A and 2B is appropriate and should not be changed.

The Examiner has rejected claims 24-48 under 35 USC §103(a) as being unpatentable over U.S. patent number 6,069,397 to Cornett et al. ("Cornett") considered alone, or over Cornett in view of U.S. patent number 5,446,311 to Ewen et al. ("Ewen"). For the reasons discussed below, Applicant respectfully submits that the present

invention, as defined by amended independent claim 24 and independent claims 31 and 37, is patentably distinguishable over Cornett, Ewen, or any combination thereof.

The present invention, as defined by amended independent claim 24 and independent claim 37, respectively, teaches a conductor or inductor patterned in a second area of a dielectric. A permeability conversion material is interspersed within the second area of the dielectric such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric. Thus, as disclosed in the present application, the permeability conversion material increases the permeability of the second area of the dielectric. By interspersing the permeability conversion material within the second area of the dielectric, the amount of permeability conversion material can be controlled to achieve a desired increase in the permeability of the second area of the dielectric. For example, a small amount of very high permeability material, such as a nickel-iron alloy, interspersed within the second area of the dielectric can result in a significant increase in the permeability of the second area of the dielectric.

Additionally, increasing the permeability of an area of a dielectric by interspersing permeability conversion material within the dielectric area advantageously allows control over the particular area of the dielectric in which the permeability conversion material is dispersed. For example, the permeability conversion material may be dispersed only in an area of the dielectric that includes an inductor, and not in a neighboring dielectric area.

In contrast, Cornett and Ewen do not, singly or in combination, teach, disclose, or suggest a permeability conversion material interspersed within a second area of a

dielectric including an inductor or conductor, such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric.

Cornett specifically discloses inductor 220 implemented as a layer of integrated circuit 200. See, for example, Cornett, column 2, lines 17-18. Inductor 220 is situated over passivation layer 217. See, for example, column 2, lines 12-25 and Figure 2 of Cornett. Inductor 220 includes patterned conductive trace 110, i.e. an inductor, embedded within magnetic material layer 221 and magnetic material layer 223. See, for example, column 2, lines 18-21 and Figure 2 of Cornett.

In Cornett, conductive trace 110 is formed by depositing a first layer of magnetic material, i.e. magnetic material layer 221, on passivation layer 217. Conductive trace 110 is patterned and a second layer of magnetic material, i.e. magnetic material layer 223, is disposed on patterned conductive trace 110, i.e. an inductor, and the first layer of magnetic material. See, for example, Cornett, column 2, lines 43-48. Thus, in Cornett, patterned conductive trace 110 is situated between magnetic material layers 221 and 223, which have a permeability that remains unchanged. Patterned conductive trace 110 is not situated in a second dielectric area that has an increased permeability relative to the permeability of a first dielectric area as a result of interspersed permeability conversion material that is introduced into the second dielectric area. In fact, Cornett does not teach, disclose, or suggest any permeability conversion material that is interspersed within a dielectric area to increase the permeability of the dielectric area. For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended

independent claim 24 and independent claim 37, is not suggested, disclosed, or taught by Cornett.

The Examiner has stated that it would have been obvious to use a dielectric layer, i.e. dielectric layer 2 in Figure 3 of Ewen, comprising silicon oxide in Cornett in order to insulate the device with a conventional insulating material. Applicant respectfully submits that amended independent claim 24 and independent claim 37 are distinguishable over Ewen. As discussed above, the present invention, as defined by amended independent claim 24 and independent claim 37, teaches a permeability conversion material interspersed within a second area of a dielectric including an inductor or conductor, such that the permeability of the second area of the dielectric is higher than the permeability of a first area of the dielectric.

In contrast, Ewen specifically discloses a spiral inductor structure having three levels of metal connected by vias. See, for example, Ewen, column 2, lines 11-28. Each metal level is, in turn, situated on a layer of silicon oxide to isolate the metal levels. See, for example, Ewen, column 2, lines 14-24. In Ewen, the spiral inductor structure includes two identical spiral metal patterns connected in parallel on two different metal levels to reduce DC resistance. See, for example, Ewen, column 2, lines 26-31. However, Ewen does not teach, disclose, or suggest an increased permeability of any of the silicon oxide layers resulting from interspersed permeability conversion material within the silicon oxide layer. In fact, Ewen does not teach, disclose, or suggest increasing the permeability of any of the silicon oxide layer in any manner. For the foregoing reasons, Applicant

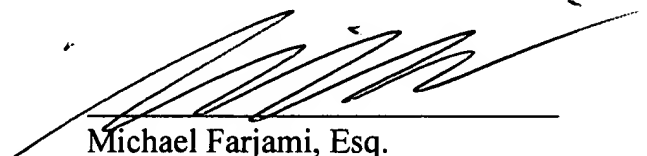
respectfully submits that the present invention as defined by amended independent claim 24 and independent claim 37 is not suggested, disclosed, or taught by Ewen, either singly, or in combination with Cornett. As discussed above, amended independent claim 24 and independent claim 37 are patentably distinguishable over Cornett and Ewen and, as such, claim 26 and claims 28-30 depending from amended independent claim 24 and claims 38-48 depending from independent claim 37 are, a fortiori, also patentably distinguishable over Cornett and Ewen.

The present invention, as defined by independent claim 31, teaches an inductor patterned in a dielectric having a first permeability. A permeability conversion material having a second permeability is interspersed within the dielectric, where the second permeability is greater than the first permeability. Thus, as disclosed in the present application, the permeability conversion material is interspersed within the dielectric to increase the permeability of the dielectric. The fact that a permeability conversion material is interspersed within a dielectric, where the permeability of the permeability conversion material is greater than the permeability of the dielectric, results in the various advantages discussed above. As such, and based on the foregoing reasons in relation to amended independent claim 24 and independent claim 37, independent claim 31 is patentably distinguishable over Cornett and Ewen, either singly or in combination. Thus, claims 32-36 depending from independent claim 31 are also patentably distinguishable over Cornett and Ewen.

Based on the foregoing reasons, the present invention, as defined by amended independent claim 24 and dependent claims 31 and 37 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 24-26 and 28-48 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 24-26 and 28-48 pending in the present application is respectfully requested.

Respectfully Submitted,
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Date: 1/28/02


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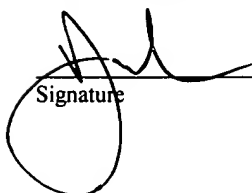
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FIG. 3A (Amended Drawing)

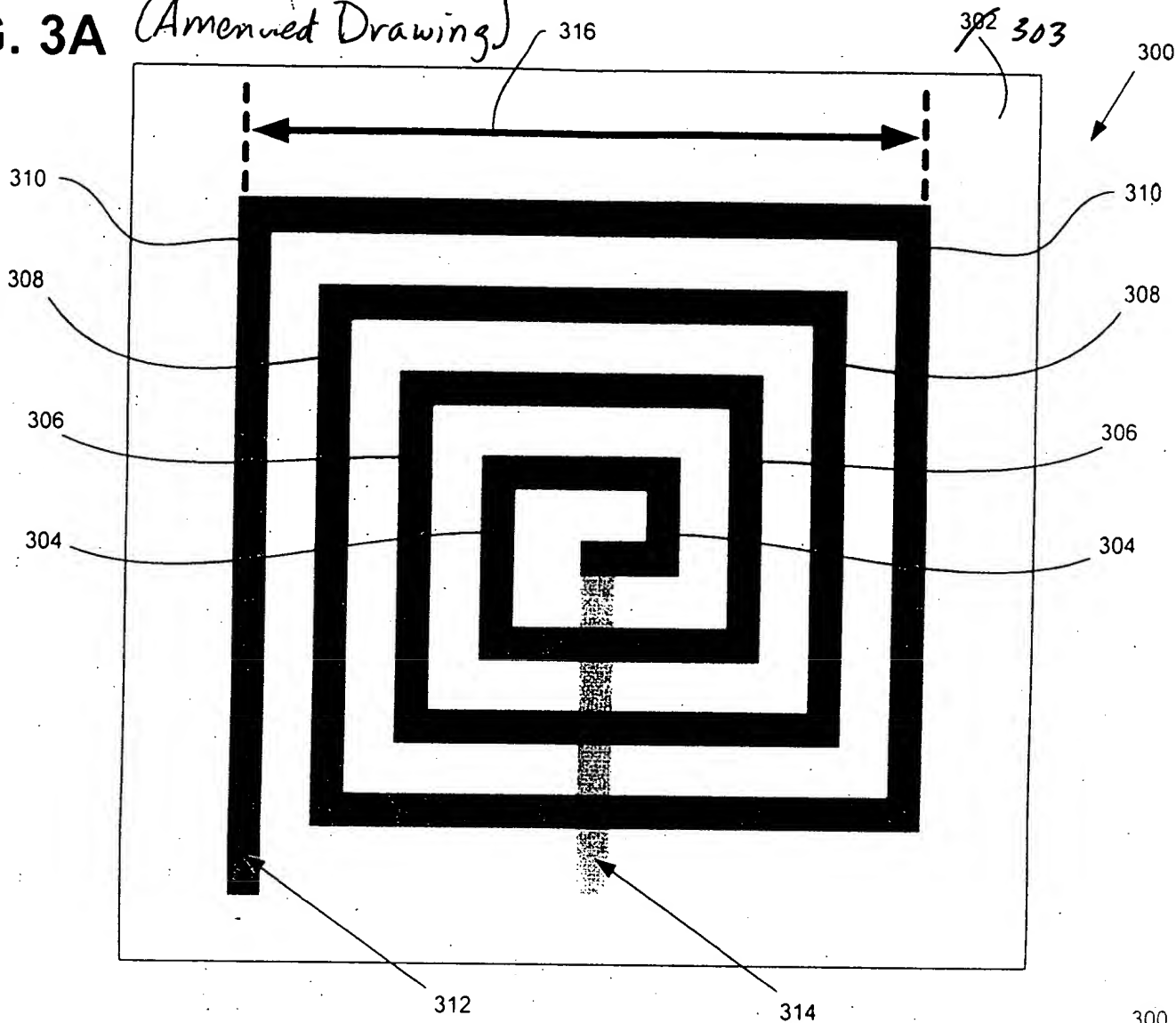
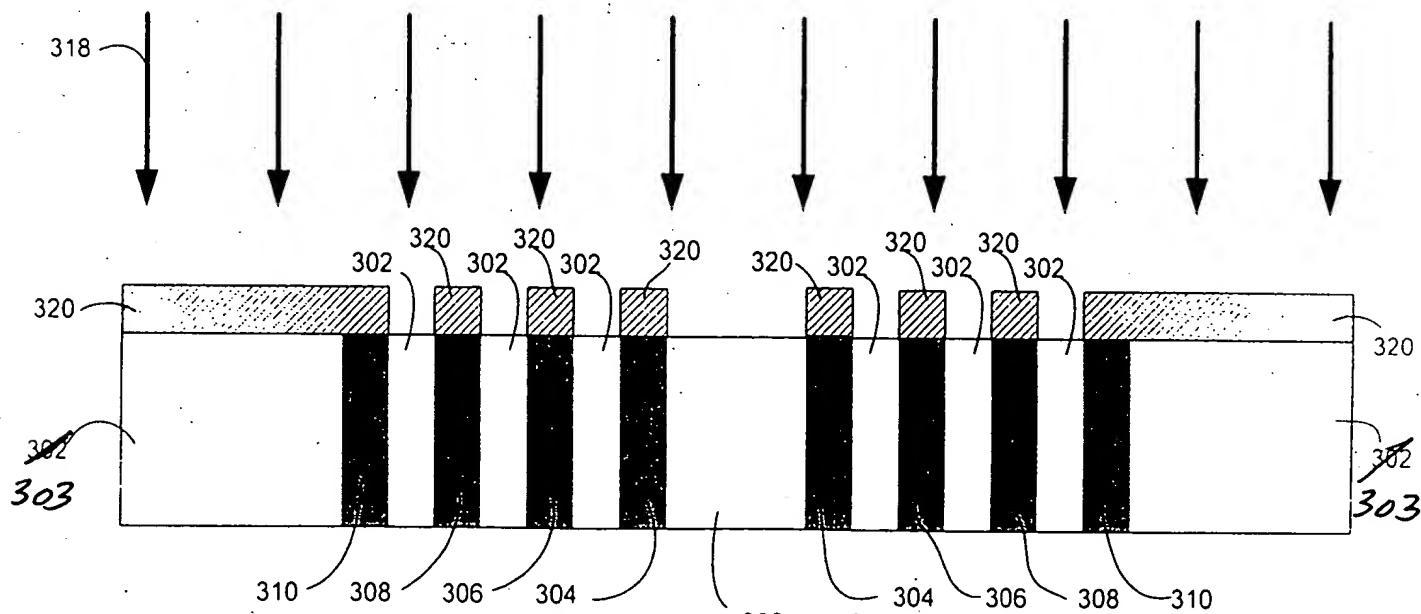


FIG. 3B (Amended Drawing)



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